

**Contributions to the bryology and hepaticology of North America / by William S. Sullivan.**

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Sullivan, William Starling, 1803-1873.

**Publication/Creation**

Cambridge (Mass.) : Metcalf and company, 1846.

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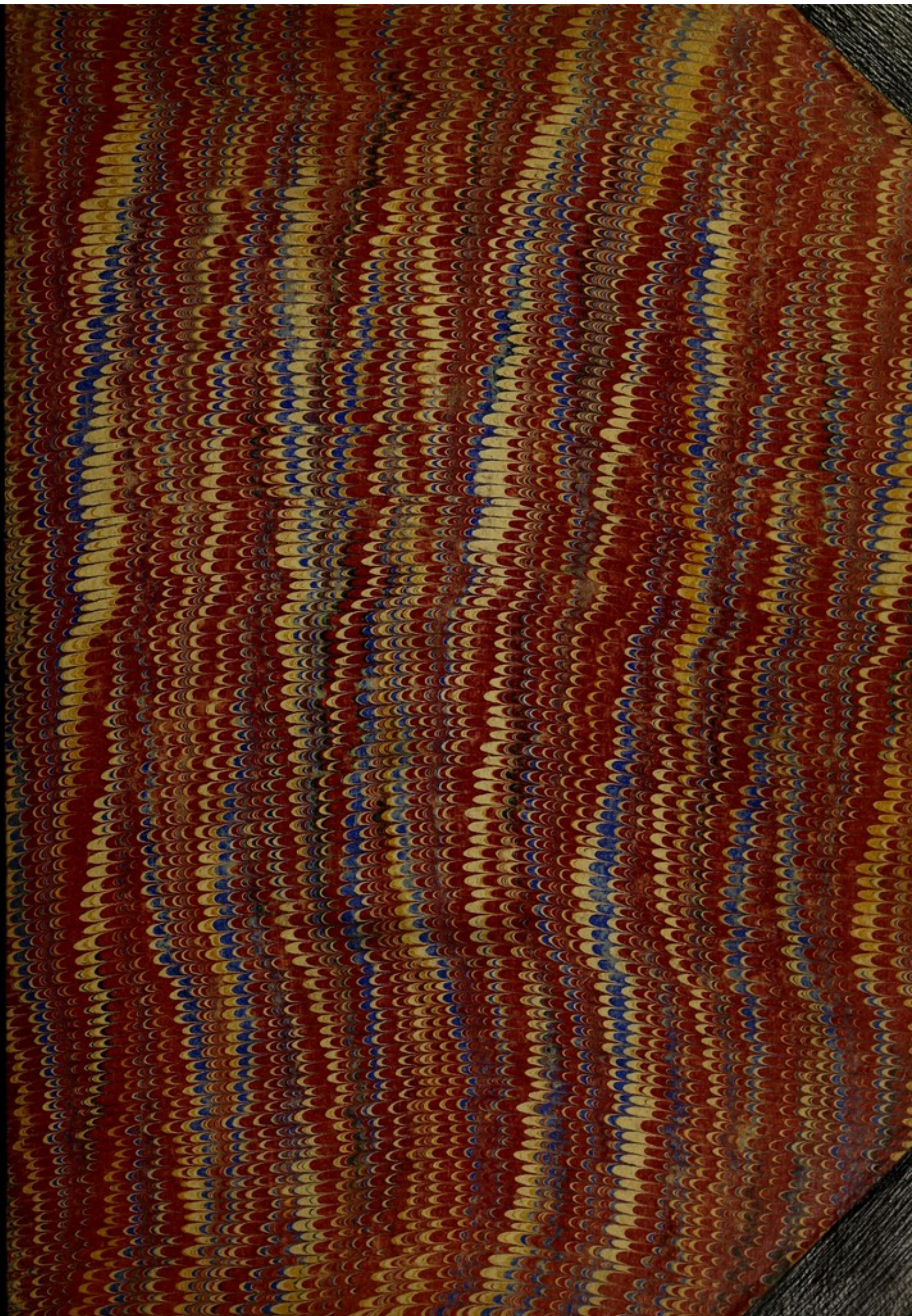
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A.C. DuRoi

II.

*Contributions to the Bryology and Hepaticology of North America.*

By WILLIAM S. SULLIVANT.

PART I.

(Communicated to the Academy, August 12th, 1846.)

1. PHYLLOGONIUM NORVEGICUM, *Brid. Bryol. Univ.* 2, p. 674. — *Musc. Alleghan. n.* 188.

It may be doubted if this rare moss and the tropical *Pterigynandrum fulgens*, *Hedw.*, the type of *Phyllogonium*, *Brid.*, are referable to the same genus. A striking dissimilarity in habit, mode of growth, and in the position of the female flowers (which are terminal in the one, but lateral in the other), as well as the structure and reticulation of the leaf, all indicate their separation generically. The genus of our moss must remain uncertain until the discovery of its fruit, which we may now expect, since a second locality has been found, in Ohio, producing both male and female plants abundantly. The notice of this moss in the *Bryologia Universalis* is evidently founded on infertile plants alone, collected in Norway, the original locality. Our Ohio specimens furnish the following additional particulars.

Caules plerumque simplices, rarissime e medio vel e summitate innovantes. Folia, illis caulium steriliū exceptis, versus apicem



caulis sensim majora ; floralia 4-6, erecto-patentia, longissime acuminata, acumine diaphano flexuoso subserrulato. Flores diœci, in caule primario vel in innovationibus e summitate progredientibus terminales : uterque flos diphyllus ; archegonia 8-12 stylo longissimo instructa, stigmate magno dilatato ; antheridia 10-14, elongato-fusiformia, brevissime stipitata ; paraphyses haud numerosæ, tenerrimæ, genitalibus utriusque sexus immixtæ, atque in foliorum superiorum gremio per paria nidulantes. Folia perichætialia et perigonia floralibus similia, sed paulo majora.

It grows in large patches, pendent from the perpendicular faces of sandstone rocks, in moist, shady places, six or eight miles south of Lancaster, Ohio.

TAB. I. — *Fig.* 1. Plants of the natural size. *Fig.* 2. The same, magnified. *Figs.* 3, 4. Apices of cauline leaves. *Figs.* 5, 13, 14. Transverse sections of the leaf. *Fig.* 6. Cauline leaf. *Fig.* 7. Perichætial leaf. *Fig.* 8. Archegonia and paraphyses. *Fig.* 9. Perichætial leaves inclosing archegonia. *Fig.* 10. Antheridia and paraphyses. *Fig.* 11. Perigonial leaves inclosing antheridia. *Fig.* 12. Part of the stem. Magnified.

## 2. FISSIDENS MINUTULUS, *Sulliv. Musc. Alleghan. n.* 183.

Planta e perpusillis gentis, vitam annuam degens. Caules simplices, assurgentes, circiter sesquilineales, basi radiculosæ, dense gregariæ, sed nunquam inter se radiculis intertextæ. Folia erecto-patentia, 4-8-juga ; inferiora minuta, remota, subsquamiformia ; superiora in ascendendo magis magisque majora, oblique lineari-lanceolata, acuta, fere ad medium usque conduplicata ; lamina apicali subrepanda plus minus limbata ; limbo haud incrassato e cellulis elongato-fusiformibus diaphanis conflato ; costa pellucida, in apice evanescente percursa, rotundato-hexagone areolata. Flores diœci,



terminales. Folia perigonialia 2, basi ventricosovaginantia, parte superiore conduplicaturæ eroso-truncata, cæterum caulinis similia; antheridia 3-4, filamento brevissimo suffulta, paraphysibus nullis: perichætialia 2, caulinis superioribus conformia sed longiora. Capsula erecta, symmetrica, ovalis, inferne attenuata, siccitate sub ore dilatato constricta: pedicellus 1 lineam longus, e basi geniculata flexuoso-ascendens, siccus sinistrorsum tortus: peristomii dentes erecto-incurvati, rubelli, apice ultra medium fissi, dense articulati, cruribus inæqualibus subulatis granuloso-scabris: operculum conico-rostratum; rostro recto, aut vix curvato, dimidiam capsulæ partem longitudine æquante: calyptra solum operculum obtegens, conico-subulata, uno latere profunde fissa: sporæ majusculæ diametro æquantes dentis basi dimidiam latitudinem.

This species grows on stones in the bed of desiccated rivulets, in shaded places, near Columbus, Ohio; it fruits in July and August.

Besides other marks of less importance, the diœcity of this moss readily distinguishes it from *F. incurvus*, *Br. & Sch.*, small forms of which it much resembles. The character in the foregoing description, drawn from the relative length of the diameter of a spore and the breadth of a tooth of the peristome near the base, may be made available in many cases for distinguishing species. In the present species and its nearest ally, *F. incurvus*, this character is efficient, since in the latter a spore equals one third the breadth of the peristomal tooth. In the *F. obtusifolius*, *Wils.*, the spores are unusually large, one being more than sufficient to cover the breadth of a tooth.

TAB. II. *A.* — *Fig. 1.* Plants of the natural size. *Figs. 2, 4.* Capsules. *Fig. 3.* Calyptra. *Fig. 5.* Female plant. *Fig. 6.* Male plant. *Fig. 7.* Antheridia. *Fig. 8.* A leaf. *Figs. 9, 10.* Portions of a leaf. *Fig. 11.* Portion of the peristome. *Fig. 12.* Spores. All except *Fig. 1* more or less magnified.



### 3. FISSIDENS EXIGUUS, *Sulliv. Musc. Alleghan. n. 182.*

*F. annuus*, dioicus; caule simplici; foliis 5–9-jugis oblongo-lanceolatis immarginatis integerrimis, costa sub apice dissoluta; capsula terminali subobliqua vel erecta; operculo conico-rostellato; calyptra cuculliformi; flore masculo terminali.

Species præcedente dimidio major, folia minus elongata immarginata, capsula sæpius inæqualis subobliqua, sporæ minores.

It grows with the preceding species, and fruits at the same time.

Tab. II. *B.* — *Fig. 1.* Plants of the natural size. *Fig. 2.* Point of the leaf. *Figs. 3, 6.* Capsules. *Fig. 4.* Calyptra. *Fig. 5.* Female plant. *Fig. 7.* A leaf. *Fig. 8.* Antheridia. *Fig. 9.* Male plant. *Fig. 10.* Sections of leaves. *Fig. 11.* Spores. All magnified.

### 4. SCHISTIDIUM SERRATUM, *Hook. & Wils. in Drum. Musc. Amer. n. 20. — Musc. Alleghan. n. 198.*

This plant may be regarded as a highly developed state of the European *Phascum patens*; from which it is distinguished mainly by the firmer texture of the outer thecal membrane, and by a reduced form of opercular dehiscence. Its globose capsule separates at maturity into two equal portions by a circumscissile line, of which no traces are visible during the early stages of the plant, and no alteration, other than a slight discoloring of the cells near the line of separation, takes place; thus exhibiting an imperfect form of dehiscence in a moss of the operculate division.

The accordance of this plant with *Phascum patens* appears to be complete in all other important respects.



It may be here noticed, that the position and structure of the male flower of *P. patens* has been incorrectly described and figured by authors as terminal, and borne upon proper branches arising from the base of the main stem. Such is by no means the case. The male flower, as in *Schistidium serratum*, is situated near the female, rarely mixed with it, in the axils of the floral or upper leaves, either of the main stem or its innovations; the antheridia, 3-5 in number, are accompanied by paraphyses with globose terminal cells; and rudimentary perigonal leaves are occasionally present. All the North American specimens of *P. patens*, so called, that have come under my observation, belong to immature states of *Schistidium serratum*; but future examination may show that the two plants are less distinct than is at present supposed.

Our plant, as now understood, cannot be referred to the genus *Schistidium* of Bridel, much less to that of Bruch & Schimper; nor does it agree with any other well defined genus. With *Physcomitrium*, *Br. & Sch.*, it has many characters in common, and, in fact, the position of the male flower presents the only essential point of disagreement.

The plant is annual, and is often met with in the Middle and Western States, on rich soil, particularly near the margins of streams subject to inundation; it fruits during the summer and autumnal months.

TAB. II. C.—*Fig. 1.* Plants of the natural size. *Fig. 2.* Part of a plant, showing the capsule, operculum, and the position of the male flowers. *Fig. 3.* Spores. *Fig. 4.* Calyptra. *Fig. 5.* Antheridia with paraphyses. *Fig. 6.* Plant with a simple stem. *Fig. 7.* A portion of leaf. *Fig. 8.* A plant with innovations. All magnified.



5. *MARCHANTIA DISJUNCTA*, *Sulliv. Musc. Alleghan. n. 286.*

*M. dioica* ; receptaculo fœmineo excentrico subseptem-radiato, radiis apice cuneato-dilatatis emarginato-crenulatis subtus dense barbatis ; involucro 1-3-carpo subintegerrimo ; receptaculo masculo semicirculari 7-radiato, radiis usque ad brevem pedunculum discretis ; fronde dichotoma et articulatim innovante : cætera *M. polymorphæ*.

This, the second species of the genus known to the flora of the United States, differs strikingly from all others in its male receptacle. It has nowhere been found except on the high banks of the Alabama river, near the town of Claiborne, where I met with it in May, 1845.

TAB. III. — *Fig. 1.* Female plant, natural size. *Fig. 2.* Male plant, natural size. *Fig. 3.* Male receptacle, with a portion of the frond. *Fig. 4.* Transverse section of a ray of the male receptacle. *Fig. 5.* A gemmiferous cup. *Fig. 6.* Portion from the margin of the same. *Fig. 7.* Gemmæ. *Fig. 8.* Female receptacles. *Fig. 9.* Perpendicular sections of the same. *Fig. 10.* Perianth and calyptra. *Fig. 11.* A young pistil. *Fig. 12.* Chaffy scales of the receptacle. *Fig. 13.* Transverse section of the peduncle. *Fig. 14.* Spores and an elater. *Fig. 15.* Portion of a radicle. All the analyses are more or less magnified.

6. *ANEURA SESSILIS*, *Musc. Alleghan. n. 280.*

*Jungermannia sessilis*, *Spreng.* — *Lehm. Pugill. 4, p. 34.* — *Hook. & Wils. in Drumm. Musc. Amer. n. 174.*

The notices heretofore taken of this species appear to have been drawn from imperfect specimens of the female plant. *Aneura ses-*

silis is dioecious, with the antheridia embedded in the upper and concave surface of elongated tapering and deflexed processes, which, in clusters of 2–4 together, proceed from the margin of the frond. The capsule, in its normal state, is borne upon a long exserted pedicel; and even in cases where the capsule is apparently sessile (whence the specific name), the pedicel is of the usual length, but is folded up within the calyptra, whose thick substance resists its protrusion.

This species belongs to the Southern States; it fruits copiously in the cypress swamps around New Orleans, always growing on decayed logs. It is occasionally found as far north as in central Ohio, where, however, it requires artificial protection to mature its fruit.

TAB. V. — *Fig. 1.* Female plant, natural size. *Fig. 2.* Male plant, natural size. *Fig. 3.* Portion of a frond, with marginal processes or male receptacles. *Figs. 4, 5, 6.* Male receptacles. *Fig. 7.* Portion of a frond, with calyptra, pedicel, and capsule. *Fig. 8.* Young fruit. *Fig. 9.* Transverse section of a calyptra. *Fig. 10.* Upper part of a calyptra. *Fig. 11.* Valves of the capsule in a dry state. *Fig. 12.* The same in a moist state. *Fig. 13.* Upper part of a valve of the capsule. *Fig. 14.* Elaters and spores. *Fig. 15.* Portion of a valve of the capsule. *Fig. 16.* Transverse section of the same. *Fig. 17.* Transverse section of the frond. The analyses are more or less highly magnified.

7. AMONG the most remarkable of North American Hepaticæ is one found near Salem, in North Carolina, by the late Mr. Schweinitz, which he made known in his *Specim. Fl. Amer. Sept. Crypt.* (1821), under the name of *Targionia orbicularis*. Subsequently, he proposed to establish for it his new genus *Carpobolus*, of which he gave a detailed description and figure in the *Journ. Acad. Nat. Sci. Philad.* (1822).



Since the discovery, in Ohio, of two other plants, congeners with that of Mr. Schweinitz, it became necessary to reform the generic characters. The generic name has also been changed to *Notothyas*; the name of *Carpobolus* having been previously applied to a genus of Fungi, which is still retained by some authors; furthermore, its etymology conveys an idea inapplicable to these plants.

The genus and its species are thus characterized in the *Musci Alleghanienses*:—

**NOTOTHYLAS**, *Sulliv. Musc. Alleghan. n. 289, 290.*

*Carpobolus*, *Schweinitz*, in *Journ. Acad. Nat. Sci. Philad.* 2, p. 336. (1822).

*Targioniæ* spec., *Schweinitz*, *Specim. Fl. Amer. Sept. Crypt.* p. 23. (1821).—

*N. ab E.*, *Europ. Leberm.* 4, p. 317.

Monoica. Fructus dorsales, sparsi. Involucrum sessile, frondi continuum, initio clausum, tandem superne fatiscens. Perianthium nullum. Calyptra . . . . . Capsula involucri inclusa, oblongo-sphæroidea, compressa vel ovato-cylindrica, brevissime pedicellata, pedicello in bulbo incrassato affixo, sutura longitudinali ab apice ad medium subbivalvatim, vel sutura deficiente frustulatim, dehiscens. Columella linearis. Sporæ quaternatim aggregatæ, subglobosæ, læviusculæ. Antheridia frondi immersa, elliptico-globosa. Frons orbicularis, laciniata, tenera, papuloso-reticulata, margine undulato-crispa, subtus radiculosa, massis granulatis hic illic immersis.

Plantæ annuæ, terrestres, limicolæ, in umbrosis Ohionis, Carolinæque Septentrionalis observatæ.

1. *N. ORBICULARIS*, *Sulliv.* (*Carpobolus orbicularis*, *Schweinitz*, *l. c.*) involucro suberecto; capsula oblongo-ellipsoidea compressa cum vel absque sutura concolori: cætera ut in *N. valvata*.



Diagnosis secundum specimina *Schweinitziana* in *Herb. Acad. Nat. Sci. Philad.*

HAB. In Carolina Superiore prope Salem.

2. *N. VALVATA*, *Sulliv.*: fronde diametro tri-octolineari; involucro horizontali deflexo corniformi; capsula elongato-cylindrica curvula sutura colorata semper instructa; sporis luteolis subfuscisve.

HAB. In humidiusculis circa Columbus Ohionis, sat frequens. — Maturescit Æstate-Autumno.

3. *N. MELANOSPORA*, *Sulliv.*: capsula sutura omnino nulla; columella appendiculata; sporis atrofusis dimidio majoribus quam in præcedente: cætera conveniunt.

HAB. In iisdem locis cum priore; rarissima.

We have here a genus that cannot be placed in any of the tribes of Hepaticæ as now circumscribed. Its station is between Anthocerotæ and Ricciæ. The frond is undistinguishable from that of *Anthoceros*, to which genus it also approaches in its tendency to bivalve dehiscence, in the presence of a columella, and in the manner of ripening the spores, which commences at the apex of the capsule and proceeds towards its base, so as to present spores in all stages of development. A relationship to *Riccia* is shown by the inclosure of the sessile capsule in the frond, or rather in a protruded portion of it, as also by its embedded anthers, and the absence of anything like elaters. Unlike both of the above genera, the calyptra, if present at all, vanishes at an extremely early stage of the plant's growth; for, in many dissections of *N. valvata* and *N. melanospora*, at all periods of growth, I have never seen a calyptra. The only

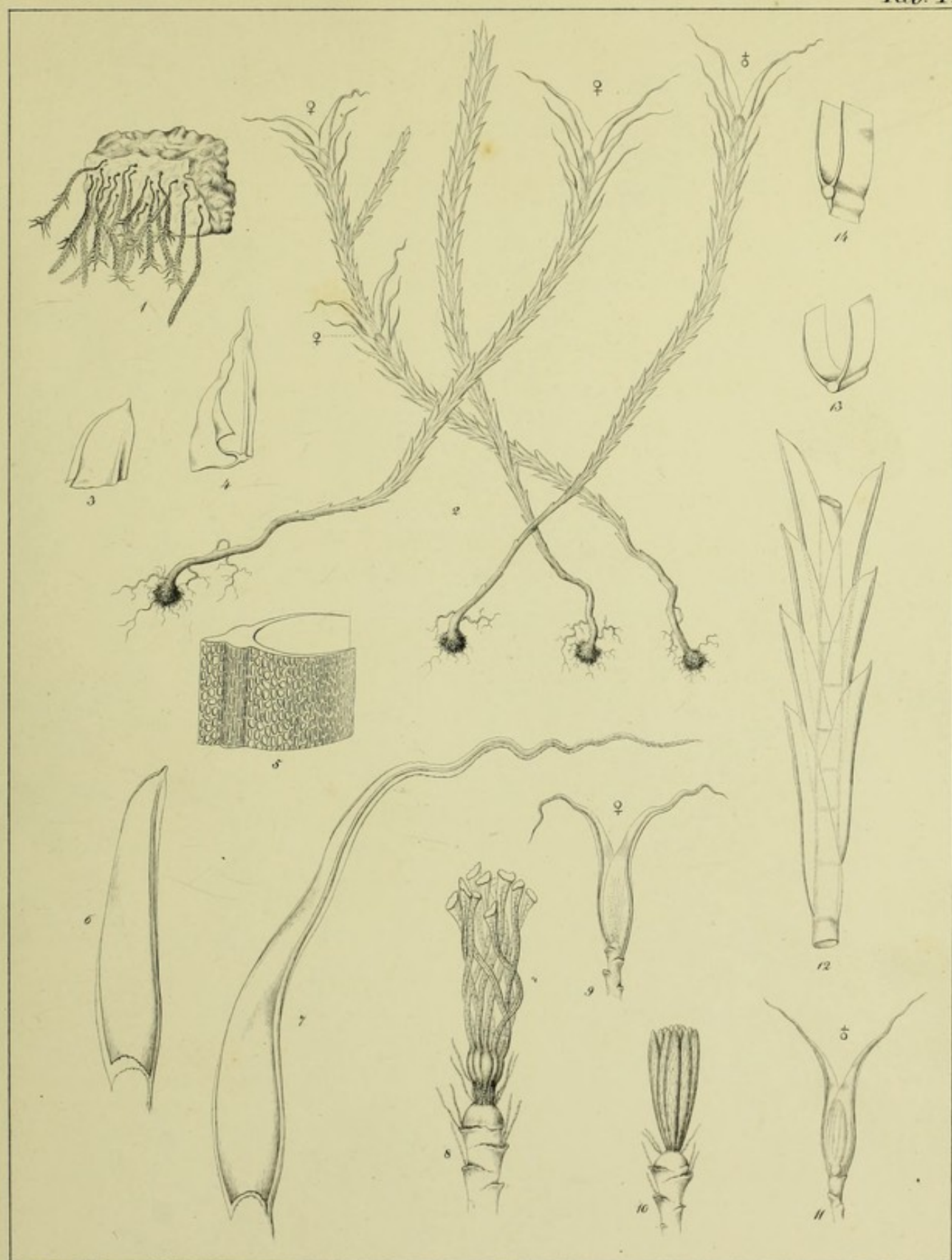


indication of its existence is the bulb at the base of the capsule, which may be the rudiment of that organ. Mr. Schweinitz appears to have detected no calyptra, and my examination of authentic specimens of the same species gave a similar result. I was, however, able to verify the presence of the columella pointed out by him in his first notice of the Southern species, but which, in his second and more extended account, is not referred to. With regard to the three species here given, it can hardly be questioned that *N. orbicularis* is distinct from the Ohio species; but that the two plants are equally distinct from each other is not so entirely free from doubt. Still, the specific characters assigned them have thus far proved constant. What phases other localities may produce remain to be seen; for the present (with Nees), "malo peccare in discriminandis quam in confundendis rerum naturæ cognitionibus."

TAB. IV. *A. N. valvata*. — *Fig.* 1. Plants of the natural size. *Fig.* 2. Portion of the frond, with an involucre and capsule. *Figs.* 3, 4. Involucres and capsules. *Fig.* 5. A capsule dissected, showing the columella. *Fig.* 6. Vertical section of an involucre and a portion of the frond, exposing the capsule. *Fig.* 7. A capsule dehiscing by its suture. *Fig.* 8. Spores. *Fig.* 9. Upper part of a capsule, showing the line of dehiscence and reticulation. *Fig.* 10. Portion of a frond, showing the imbedded anthers and masses of granules. *Fig.* 11. Antheridia. *Fig.* 12. Mass of granules. All magnified.

*B. N. orbicularis*. — *Fig.* 1. Plant of the natural size. *Figs.* 2, 3. A portion of the frond, with fruit. *Fig.* 4. Involucre and capsule. *Fig.* 5. Capsule bursting irregularly. *Fig.* 6. Spores. The analyses all magnified.

COLUMBUS, OHIO, *June*, 1846.



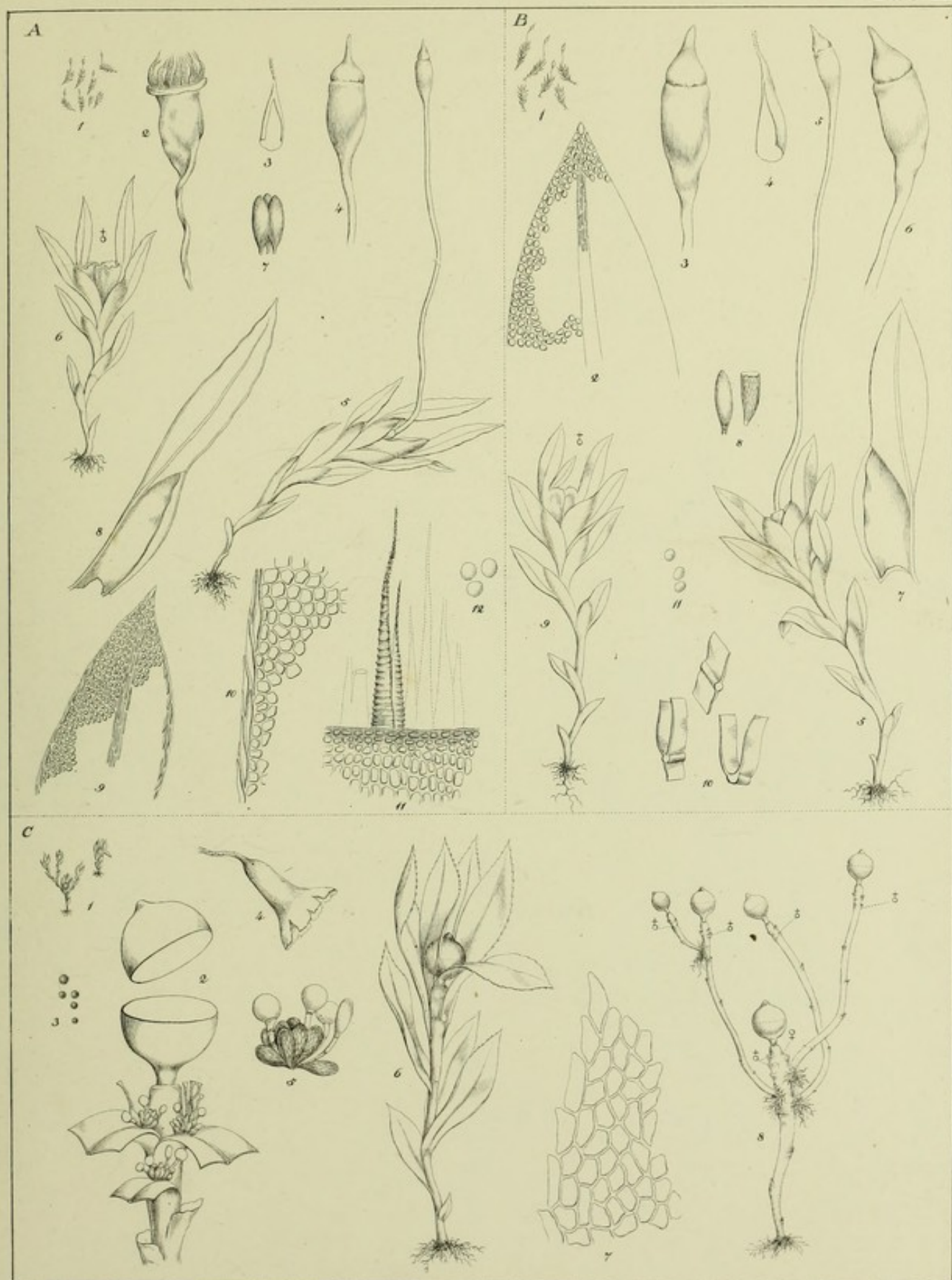
W. S. S. del.

J. Prestile sc.

*Phyllogonium Norvegicum.*







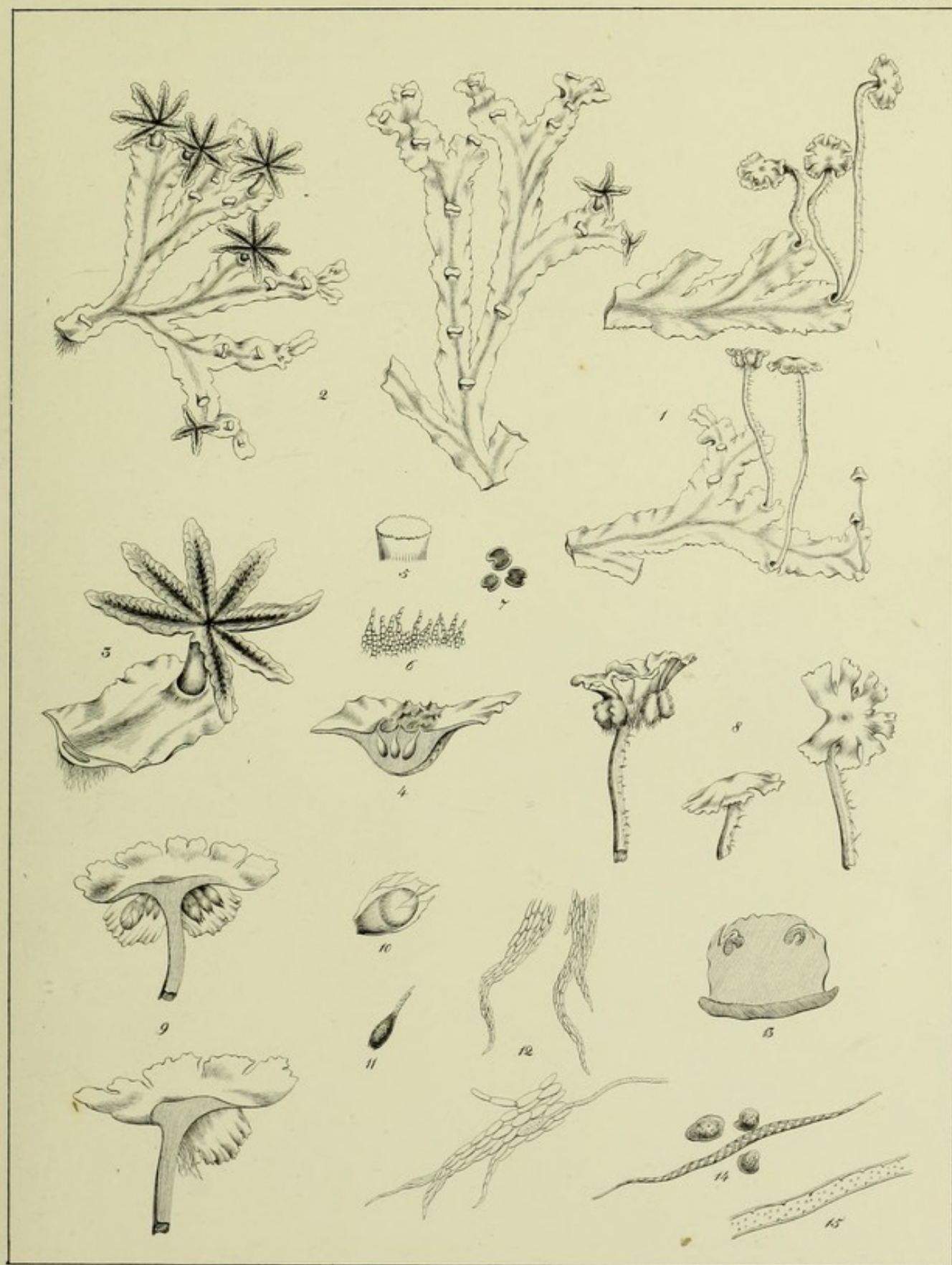
W.S.S. del.

Hall & McNeely exc.

A. *Fissidens minutulus*, B. *F. eciguus*.  
C. *Schistidium serratum*.



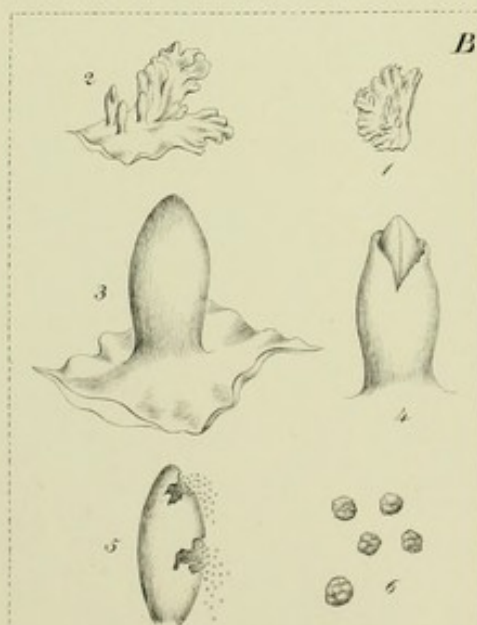
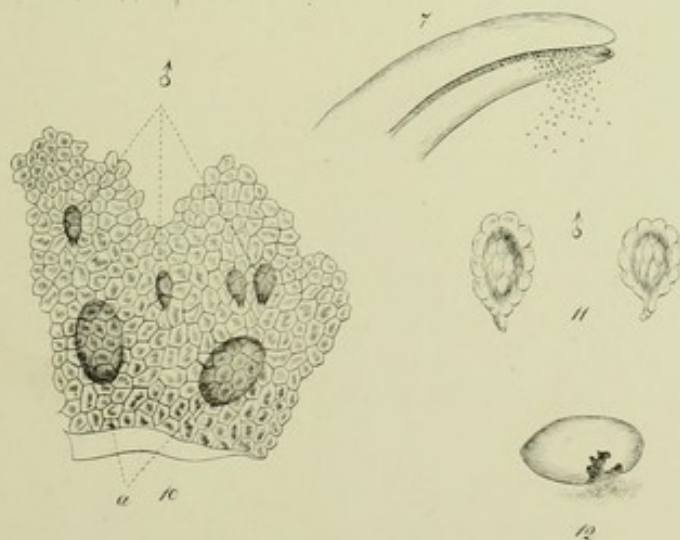
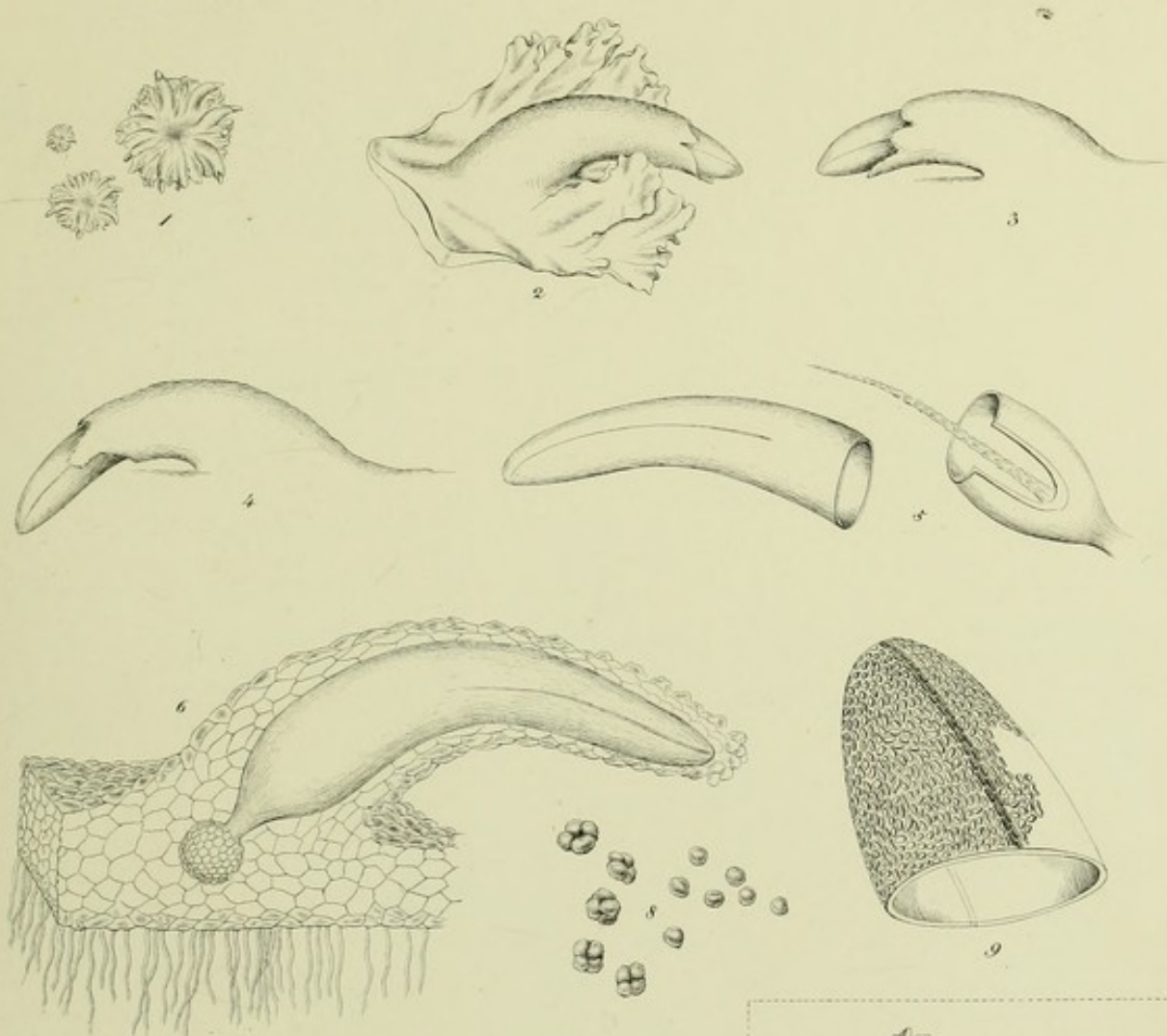






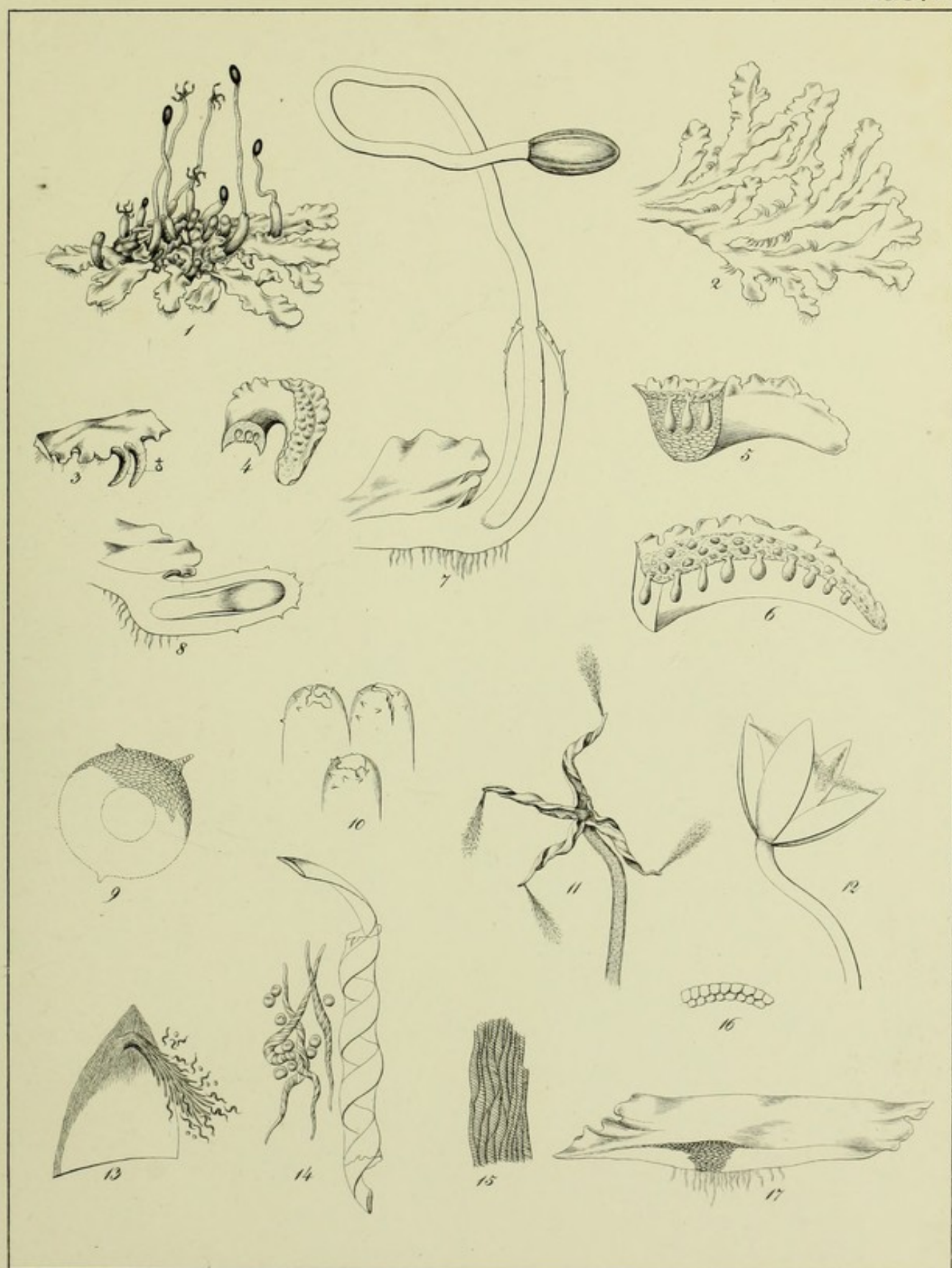


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# V.

## Contributions to the Bryology and Hepaticology of North America.

By WILLIAM S. SULLIVANT.

### PART II.

(Communicated to the Academy, November 8th, 1848.)

1. *LESKEA FENDLERI* (sp. nov.): hermaphrodita; caule intricato-repente ramosissimo, ramis brevibus surrectis; foliis imbricatis erecto-patulis ovato-lanceolatis serratis evanidi-costatis; capsula oblonga suberecta subæquilaterali, operculo elongato-conico.

HAB. On rocks, in the vicinity of Santa Fé, *Mr. Fendler*.\*

\* The following list of Mosses and Hepaticæ, collected in 1847 near Santa Fé, New Mexico, by Mr. Fendler, will be interesting to the bryologist as indicating the range of species. It is proper to state that Mr. Fendler's knowledge of these orders was very limited, and that their collection was with him a secondary object; also that the adjacent mountains furnished none of the species here enumerated, the valley of the Rio Chiquito, or Santa Fé Creek, being his principal locality. — *Atrichum angustatum*, *Beauv.* *Barbula mucronifolia*, *B. & S.* *B. ruralis*, *Hedw.* *Bartramia fontana*, *Brid.* *Bryum argenteum*, *L.* *B. caespitium*, *L.* *B. crudum*, *Schreb.* *B. Duvalii*, *Voit.* *B. inclinatum*, *B. & S.* *B. intermedium*, *Brid.* *B. pseudo-triquestrum*, *Schwagr.* *B. pyriforme*, *Hedw.* *B. Wahlenbergii*, *Schwagr.* *Ceratodon purpureus*, *Brid.* *Dicranum Muhlenbeckii*, *B. & S.* *D. rhabdocarpum*, *Sulliv.* *Encalypta ciliata*, *Hedw.* *E. rhabdocarpa*, *Schwagr.* *Fabronia pusilla*, *Schwagr.* *Fissidens bryoides*, *Hedw.* *Fontinalis antipyretica*, *L.* *Funaria hygrometrica*, *Hedw.* *Grimmia calyptrata*, *Hook.* *G. ovata*, *W. & M.* *Hedwigia ciliata*, *Hedw.* *Hypnum atrovirens*, *Schimp.* *H. catenulatum*, *Brid.* *H. cupressiforme*, *L.* *H. diversifolium*, *Schimp.* *H. luridum*, *Swartz.* *H. riparium*, *L.* *H. ruscifolium*, *Neck.* *H. salebrosum*, *Hoffm.* *H. stellatum*, *Schreb.* *Leskea attenuata*, *Schreb.* *L. Fendleri*, *Sulliv.* *L. polyantha*, *Hedw.* *L. Sprucei*, *Mont.* *L. tenuirostris*, *B. & S.* *Mnium cuspidatum*, *Hedw.* *M. serratum*, *Brid.* *Neckera oligocarpa*, *Schimp.* *Orthotrichum anomalum*, *Hedw.* *O. cupulatum*, *Hoffm.* *O. speciosum*, *N. ab E.* *O. Sturmii*, *H. & H.* *Polytrichum juniperinum*, *Hedw.* *Pottia subsessilis*, *B. & S.* *Pterigynandrum nervosum*, *Brid.* *Schistidium ambiguum*, *Sulliv.* *S. pulvinatum*, *Brid.*



DESCR. Planta late denseque cæspitosa. Caules prostratæ intricato-implexæ, ramos breves erectos teretes 3–4 lineares simplices vel ramulosos emittentes. Folia undique imbricantia erecto-patentia ovata longe-acuminata, vel ovato-lanceolata concava, margine inferiore reflexa, fere toto ambitu serrata, costa paulo ultra medium evanescente instructa, tenuissime lineari-areolata, cellulis ad angulos basis externos amplis quadratisque, e lutescente viridia nitentia. Perichætialia convoluta-oblonga ex apice lato rotundo laciniato-dentato in productionem linearem serratam flexuosam subiter desinentia. Antheridia archegoniis immixta ad vaginulæ basim; paraphysibus numerosissimis. Capsula oblonga, nunc subæqualis erectiuscula, nunc altero latere longiore convexiore paulo inclinata, ore subobliquo. Peristomii exterioris dentes lineari-lanceolati dense trabeculati, linea mediali notati; interioris processus e membrana lata carinati lineares pertusi longitudine denticulati, ciliolis rudimentariis vel nullis interpositis. Annulus compositus revolubilis. Pedunculus e caule flexuoso-erectus 5–7-lineas longus, basi lenissime papillosus, superne sinistrorsum, inferne dextrorsum tortilis. Operculum convexo-conicum, plus minus elongatum, rectum vel incurviusculum. Calyptra non visa.

TAB. I. — Fig. 1. A plant of the natural size. 2. The same, magnified. 3. A portion of stem. 4. The peristome. 5. Capsules. 6. Opercula. 7. The annulus. 8. The perichæth. 9. Archegonium, antheridium and paraphysis. 10. Vaginula and reproductive organs. 11. Perichætial leaves. 12. Stem and branch leaves. 13. Portions of leaf showing the reticulation. 14. A vertical section of the peristome, showing the columella, &c. All magnified except Fig. 1.

2. *SCHISTIDIUM AMBIGUUM* (sp. nov.): monoicum, exiguum, pulvinato-cæspitosum; caule parce ramoso; foliis oblongo-lanceolatis patulo-incurvis apice plus minus cano-piliferis, perichætialibus multo majoribus erectis elliptico-lanceolatis in pilum hyalinum grosse dentatum productis fere suæ longitudinis; capsula immersa oblongo-ovali, operculo convexo-conico brevi-rostrato; calyptra cuculliformi.

HAB. On dry rocks, near Santa Fé, *Mr. Fendler*.

The long, serrated, diaphanous points of the large perichætial leaves, the oblong-oval capsule, the small subconic operculum, and especially the cuculliform calyptra of this species, seem to require its separation from the variable *Schistidium confertum*, which in all other respects it closely resembles.

*Tetraphis pellucida*, Hedw. *Timmia megapolitana*, Hedw. *Weissia controversa*, Hedw. *W. curvirostris*, Brid. *Chiloscyphus polyanthos*, Cord. *Fegatella conica*, Cord. *Fimbriaria fragrans*, N. ab E. *Jungermannia barbata*, Schreb. *Madotheca platyphylla*, Dumort. *Marchantia polymorpha*, L. *Radula complanata*, Dumort. *Reboulia hemisphærica*, Raddi.



3. *FISSIDENS RAVENELII* (sp. nov.): dioica; caule declinato simplici minimo; foliis 8–16, (in caule sterili 18–20,) inferioribus parvulis ascendendo sensim majoribus, supremis linearibus acutis conniventibus ad medium usque conduplicatis, lamina immarginata toto ambitu subtilissime denticulata, floralium duplicaturæ marginibus limbatis repando-dentatisque, costa pellucida cum apice desinente instructis, densissime minuteque subquadrato-areolatis, siccis guttulatis; capsula erecta in pedicello sinistrorsum torto ovali-oblonga subpapulosa, peristomii dentibus dense trabeculatis, operculo conico-rostrato, calyptra conica uno latere fissa: flore masculo terminali.

HAB. Detected, March, 1847, by *H. W. Ravenel, Esq.*, on damp ground near the Santee Canal, South Carolina. Also at Society Hill, South Carolina, by *Rev. M. A. Curtis*.

A very distinct and well-marked species, nearly related to *F. exiguus, Sulliv.*, and *F. Bloxami, Wils.* The former of these two species is known by the looser and larger reticulation and the entire margin of its broader leaf; in the latter species, the want of a bordering to the margins of the duplication, the vanishing of the dorsal ala considerably above the base of the leaf, and the position of the gemmiform male flower, are good distinctive marks. The protuberance of the outer cells of the capsule in the present species does not occur in the others above named. In *F. Ravenelii*, male and female gemmæ are occasionally met with in the axils of the lateral leaves of what in other species are considered infertile fronds. These gemmæ, upon the decay of the parent stock, become perfect plants. The same mode of propagation occurs in *F. bryoides, Hedw.*

TAB. II. — *Fig. 1.* Plant of the natural size. 2, 3, 4. The same, magnified. 5. Calyptra. 6. Capsule. 7. Tooth of the peristome, and spores. 8. The operculum. 9. A perigonal leaf. 10. Male gemma. 11. Antheridia. 12. A portion of the duplication of a leaf. 13. Leaf of male gemma. 14. A portion of the lamina of a leaf. — All except fig. 1 magnified.

4. *BRYUM LESCURIANUM* (sp. nov.): dioicum, humile, laxe cæspitosum, viridi-lutescens (nullo rubore tinctum); caule simplici declinato terra semisepulto 4–6 lin. longo; foliis erecto-patentibus, inferioribus oblongo-lanceolatis, comalibus perichætialibusque multo longioribus linearibus acuminatis, omnibus apice plus minus serratis medio margine reflexis densius lineari-areolatis, costa valida ad apicem usque producta; capsula ovali-subpyriformi in pedicello  $\frac{1}{2}$ –1 unciali basi geniculato flexuoso



erecto subpendula, annulo duplici revolubili, operculo subhemisphærico apiculato : planta mascula tenuiore, foliis perigonalibus externis e basi concava subiter linearibus patulis, intimis minoribus ovatis erectis.

*B. pulchellum*, *Musc. Alleghan. No. 101.*

**HAB.** Clay banks, in woods, Cincinnati and Lancaster, Ohio; very rare.

The large size of this Moss, its long linear perichætal leaves furnished with a large nerve, the form of its perigonal leaves, the absence of redness in the foliage, and the presence of a conspicuous annulus, separate it from the closely related *B. pulchellum*, *Hedw.* — Named for my friend, Leo Lesquereux, who discovered the Lancaster locality of this Moss, and detected its specific characters.

5. *DICRANUM RHABDOCARPUM* (sp. nov.): dioicum, densissime cæspitosum; caule pluries dichotomo ascendente tomentoso-radiculoso; foliis lutescente-viridibus nitidis erecto-patentibus (apicalibus sæpe subhomomallis) strictis concavis, caulinis lanceolatis, comalibus elongato-lanceolatis attenuatis, omnibus costa infra apicem dentatum evanida instructis, areolatione laxa; capsula erecta ovali-cylindrica regulari sicca 5–8 costata exannulata, operculo oblique longirostro: flore masculo in planta tenuiore terminali.

**HAB.** Santa Fé, New Mexico, *Mr. Fendler.*

In general aspect, *D. rhabdocarpum* is very like *D. scoparium*. Its nearest affinity, however, is with *D. palustre*, *Brid.*, from which it is distinguished by its broader and less attenuated leaves, entirely destitute of transverse undulations, with points more obtuse and strongly dentate, but mainly by its erect regular and prominently ribbed capsule. It is also destitute of the slender upright shoots, with small oval and acute leaves, which occur in *D. palustre*.

**TAB. III.** — *Fig. 1, 2.* Female and male plants, of the natural size. *3.* Antheridium and paraphysis. *4.* Perigonal leaf. *5.* Peristome. *6, 7.* Capsules. *8.* Perichæth. *9, 9.* Stem leaves. *10, 10.* Perichætal leaves. *11.* Cross sections of the same. *12, 13.* Portions of the leaf showing the reticulation. — All except *fig. 1, 2,* magnified.

6. *HYPNUM OREGANUM* (sp. nov.): dioicum; caule prostrato parce ramoso; ramis dense pinnatis; foliis e basi lata cordata ovato-longe-acuminatis serrulatis striatis nitidulis tenuissime areolatis, costa sub apice dissoluta; capsula in pedicello muriculato oblonga cernua annulata; operculo conico longe rostrato.



HAB. Oregon, between Puget Sound and Columbia River. (United States Exploring Expedition.)

This species resembles, in many respects, *H. crispifolium*, from the same locality, as described and figured by Hooker and Schwægrichen. But the opaque subpapillose leaves of the latter species, with a minute subrotund areolation, is a mark abundantly distinctive. *H. Oreganum* is very nearly related to *H. prælongum*, from which it differs by its larger size, its more rigid and densely pinnated stems and branches, not compressed, its more striated longer-acuminated leaves, and by the want of a nerve in the perichæatial leaves, &c.

7. *HYPNUM OAKESII*, *Sulliv.* (*Gray's Manual of Bot.* p. 673): dioicum; caule prostrato pinnatim ramoso, ramis flexuosis compressiusculis; foliis lanceolatis acuminatis evanidi-costatis spinuloso-dentatis; capsula ovata gibboso-inæquali longipedunculata, operculo conico-rostellato.

HAB. On decayed prostrate logs, at the base of the White Mountains, New England, detected by the late *Wm. Oakes, Esq.*

DESCR. Planta decumbens, flexilis, viridi-lutescens, nitens, stratum laxè implexum efficiens. Caulis tri-quadriuncialis, tomento radiculoso pluries dichotomo-furcato obsitus, irregulariter pinnatim ramosus, ramis dissitis patentissimis subcomplanatis elongatis flexuosis attenuatis. Folia costa circa medium evanida instructa, minute lineari-areolata, plus minus plicato-striata parcius rugulosa, margine reflexa; caulina concava, lato-ovata, brevius acuminata, patentia vel subsquarrosa; ramea ovalia, longe acuminata, patenti-erecta, apicem versus spinuloso- etiam lacinuloso-dentata. Perichætialia numerosa imbricatim conferta, exteriora reflexo-squarrosa, interiora convoluta erecta capillari-attenuata, omnia denticulata subecostata. Pedunculus e vaginula elongato-cylindrica tenuis, biuncialis et ultra, apice valde arcuatus, in sicco superne sinistrorsum inferne dextrorsum tortilis. Capsula ovata, gibboso-inæqualis, ventricosa, valde pachyderma, deorsum spectans. Peristomii exterioris dentes lineari-lanceolati dense articulati, interioris cilia lanceolata carinata, ciliolis binis interjectis. Annulus exilissimus vix ullus. Operculum conicum brevi-rostellatum. — Flos masculus in planta distincta gemmiformis, axillaris, 8–10 phyllus; perigonia ovata concava ecostata; antheridia 10–12 longius stipitata, paraphysibus immixtis.

Compared with *H. brevirostre*, *Ehrh.*, its nearest congener, *H. Oakesii* has a subpinnate (not subfasciculate) ramification; the branches straight (not incurved); leaves erecto-patent (not squarrose), oval, long-acuminate (not broadly cordate-triangular acuminate, not constricted at upper end of the lamina, nor convolute at the basal angles), strongly and



almost laciniately dentate (not slightly serrulate), with a single costa (not forked). The areolation of the leaf is more linear. The radicular tomentum of stem and branches is more abundant and much more compound in its ramification. The pedicel is longer, &c.

TAB. V. — *Fig. 1.* Plants of the natural size. 2. The same magnified. 3. The peristome. 4. Stem-leaf and cross section. 5. Branch-leaves and cross section. 6. Point of a leaf. 7. Male gemma. 8. Perichæth and vaginula. 9. Perichæthial leaves. 10. Capsule and pedicel in a dry state. 11. Operculum. 12. Radicular tomentum with a portion of the stem. All magnified except fig. 1.

8. *SPHAGNUM TORREYANUM* (sp. nov.): robustum, sordido-fuscescens; caule pedali longiore firmo diviso; ramulis 4–5 fasciculatis inferne remotis superne confertis 12–15 lin. longis 3–4 lin. latis lineari-lanceolatis complanatis plumulosis laxe foliatis; foliis patulis convolutis elongato-lanceolatis apice tubiformibus minuteque eroso-dentatis margine e cellulis exilissimis 4–5 seriatim conflato circumductis serpentino-reticulatis, transversali sectione cellulas linea spirali notatas magnas subrotundas exhibentibus, cellulis chlorophyllosis minutis triangularibus exterius interpositis; fructu ignoto.

HAB. Essex County, New York, *Dr. Torrey*.

This species is at once recognized by its large size, considerably exceeding that of any of its American congeners, and by the color of the whole plant, much like that of *S. macrophyllum*, n. 18, of Drummond's Southern Mosses.\* The arrangement of the cells of the leaf is the same as in *S. cuspidatum*.†

\* This singular Moss is doubtfully referred by Hook. & Wils. to *S. macrophyllum*, *Brid.*, a species founded on specimens purporting to have been collected near Philadelphia. No American *Sphagna* known to me accord with Bridel's description of *S. macrophyllum*, — few present more important discrepancies than the present species. Specimens of it, under the name of *S. Georgianum*, *Schw. Mss.*, are to be seen in the Schweinitzian herbarium, together with notes made (previous to 1820) by Dr. Torrey, pointing out the peculiar structure of the large cells of the leaf, which are destitute of a spiral fibre and furnished throughout their whole length with a line of unusually large and conspicuous stomata. In the event of Bridel's Moss proving to be different (which is highly probable), Schweinitz's name, "*Georgianum*," is entitled to adoption.

† The form and relative position, as seen in a cross section of the two kinds of cells comprising the leaf of *Sphagnum*, will aid in distinguishing the species. In Tab. IV. B., figs. 1, 2, 3, 4, *a* represents a cross section of the large cells, which are always destitute of chlorophyll, having their sides perforated with large circular openings or stomata, and lined (excepting in "n. 18," Drummond, l. c.) with a spiral fibre; *b* represents the same section of the small linear cells containing chlorophyll only. In the North American species, the principal types of structure appear to be the four following. Fig. 1 (tab. l. c.), large circular cells placed in con-



9. *FRULLANIA PLANA* (sp. nov.): monoica; caule procumbente vage ramoso vel subpinato; foliis subimbricatis orbiculatis auriculis parvis galeiformibus æque longis ac latis tectis cauli contiguis; amphigastriis magnis planis rotundis breviter bifidis sinu laciniisque acutis caule triplo latioribus; involucri lobis ovalibus, lobulis amphigastriique laciniis linearibus margine reflexis subrepandis, his utroque margine inferne unidentatis; perianthiis (interdum binatis) in ramulo brevi semi-exsertis oblongo-ovalibus vel subobovatis triquetris dorso sulcatis ventre acute unicarinatis sublævibus: spica mascula globosa.

*F. dilatata*, *Musc. Alleghan.* No. 269.

HAB. Chimney rocks, on the French Broad River, Eastern Tennessee.

The large plane amphigastrium, the small auricula, the oval perianth, and the considerably larger size of the whole plant, distinguish this species from *F. Eboracensis* and *F. saxatilis*. The two latter are probably one and the same species.

10. *FRULLANIA NISQUALLENSIS* (sp. nov.): digyna; caule procumbente pinnatim decomposito; foliis conferto-imbricatis oblique ovalibus acuminatis apiculatis valde inflexis, auriculis parvis ovali-galeiformibus; amphigastriis obovato-rotundis caule duplo latioribus bifidis sinu laciniisque obtusiusculis margine reflexis; involucri lobulis amphigastriique laciniis linearibus deflexo-falcatis basi cristato-ciliatis; perianthio ovali-obovato subimmerso trigono dorso convexiusculo ventre alte unicarinato.

HAB. Fort Nisqually, Oregon, on the bark of trees. (United States Exploring Expedition.)

In size, color, and ramification, this species is strikingly like *F. Tamarisci*. But its acuminate, apiculate, and inflexed leaves place it in the same section with *F. paradoxa*,

tact, with small triangular ones interposed on the outside of the leaf; *S. cuspidatum*, Ehrh.; *S. recurvum*, P. de B.; *S. molluscum*, Bruch.; *S. Torreyanum*, Sulliv. Fig. 2, both kinds of cells as in fig. 1, except that the small cells are placed on the inside of the leaf; *S. acutifolium*, Ehrh.; *S. humile*, Schimp.; *S. tabulare*, Sulliv.; *S. molle*, Sulliv. Fig. 3, large circular or oval cells not in contact, with small oval ones centrally interposed; *S. macrophyllum*, Brid.? *S. squarrosus*, W. & M. Fig. 4, large quadrangular cells in contact only at their outer and inner angles, with centrally interposed small elliptical ones; *S. cymbifolium*, Ehrh.; *S. compactum*, Brid.; *S. sedoides*, Brid.; *S. strictum*, Sulliv.



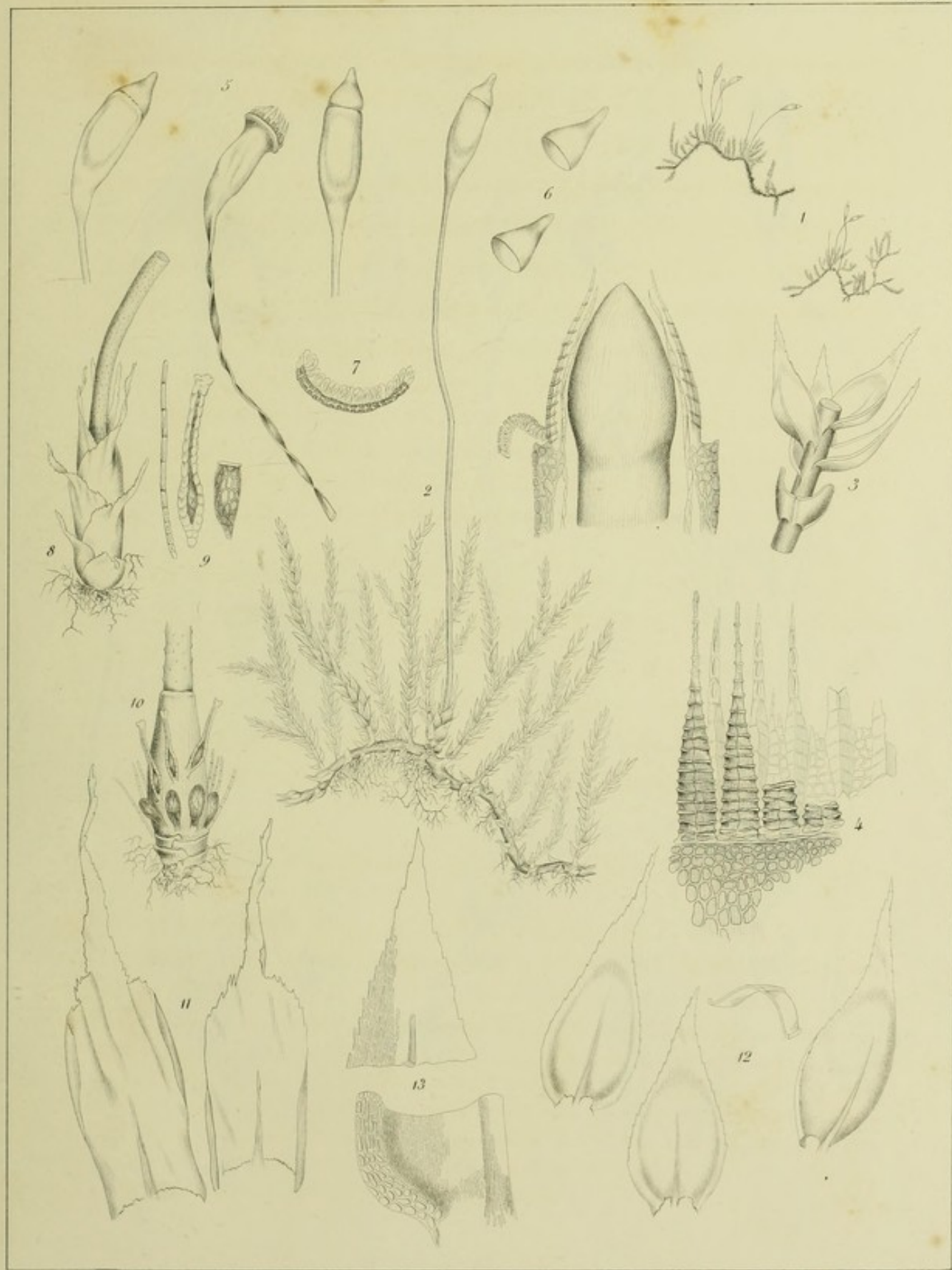
atrata, Liebmanniana, &c. It is easily distinguishable from them, however, by the amphigastrial laciniae and lobule of its involucre, which are long uncinata and ciliate-dentate at the base.

11. *RICCIA LUTESCENS*, Schweinitz! Fronde viridi-lutescente cavernosa stellatim expansa unciali et majore plus minus dissecta, laciniis subtrichotomis linearibus 1-2 lineas latis canaliculatis subplanis subtus convexiusculis radiculis margine subundulatis apice dilatatis emarginato-bilobis supra turgidis subtus squamatis, squamis transversalibus lunulato-ovatis teneris pellucidis albidis; fructu ignoto.

*Schw. Hepat. Amer. p. 26, n. 2.* — No. 156, *R. velutina*, Hook. & Wils.! in Drummond's Southern Mosses. — *Hook. Icon. Plant. v. 3, t. 249* (excl. plant. fructif.).

**HAB.** Moist ground and river-banks subject to inundations; Ohio and Southern States, frequent. No fruit has yet been found. The fruit figured in *Hook. Icon. Plant. l. c.*, Mr. Wilson informs me, belongs to *R. crystallina*.

**TAB. IV. A.** — *Fig. 1.* Plant, of the natural size. *2.* A portion of the epidermis. *3.* A cross section of a plane part of the frond. *4, 5.* Cross sections of the thickened end of the frond. *6.* Longitudinal section of the same. *7.* Under side of the same, showing the scales. — Magnified.



W.S.S. del.

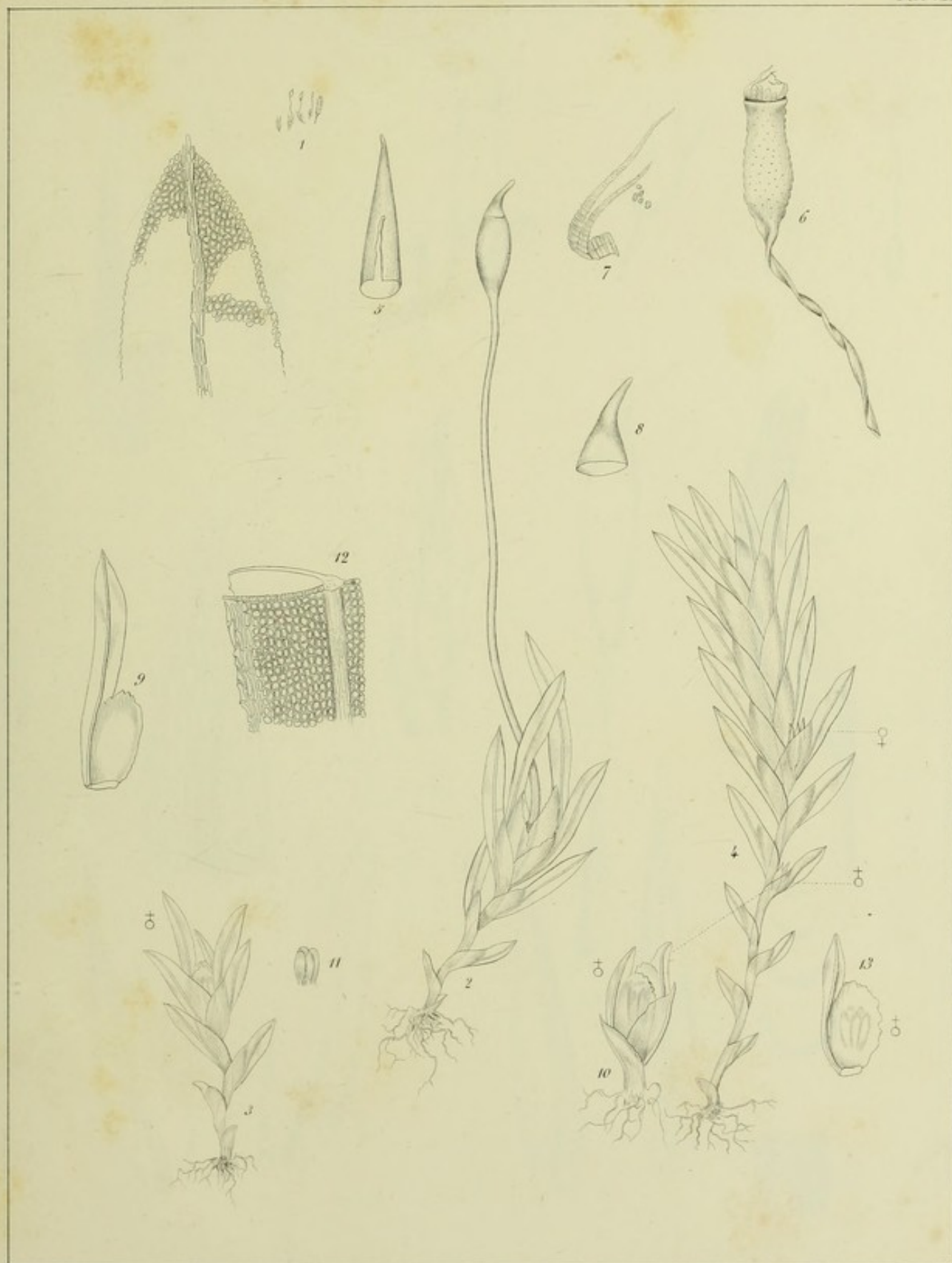
Tappan & Bradford's lith.

A. General group.

*Leskea Fendleri*. Sulliv.







W. S. S. del.

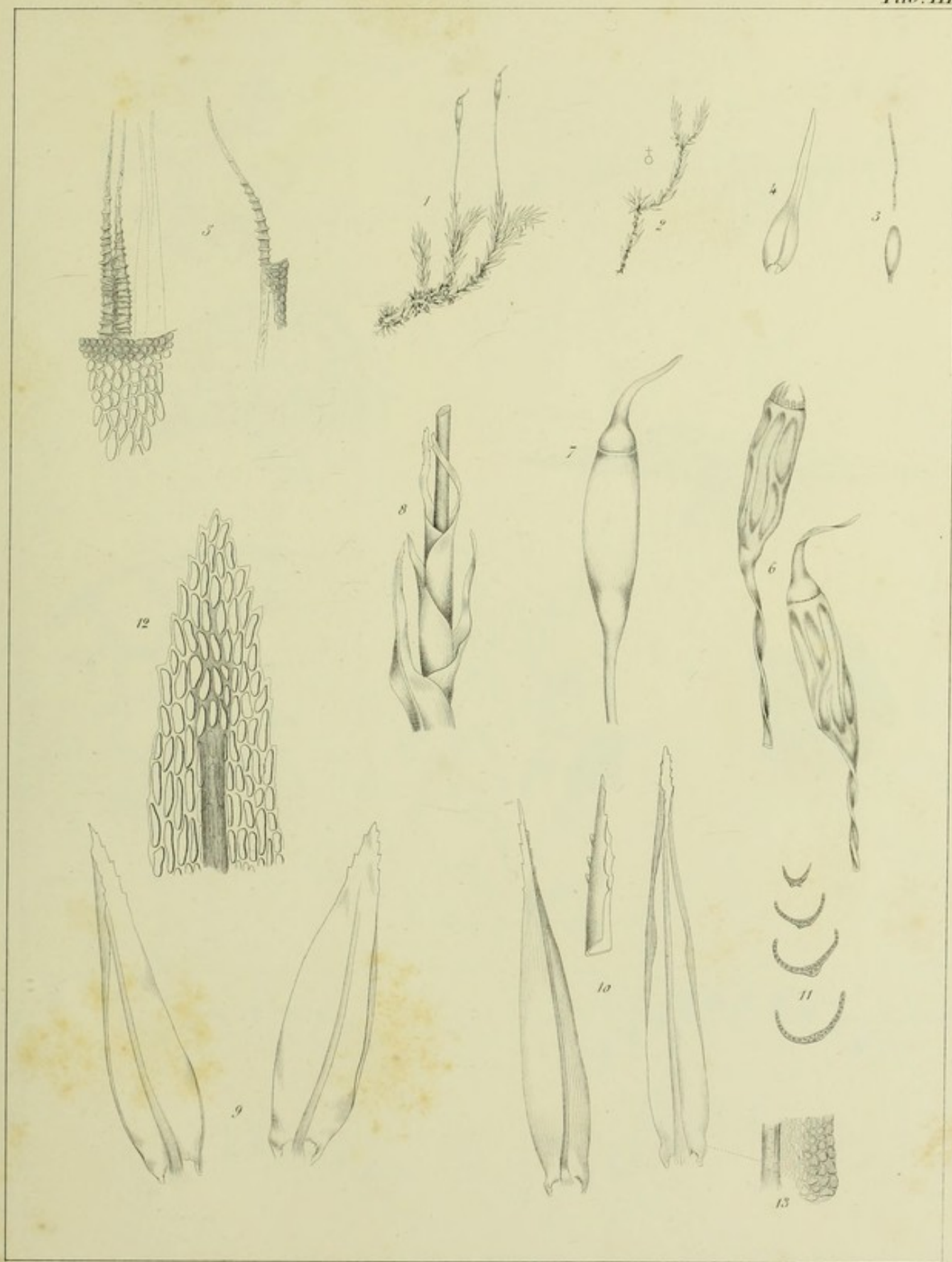
Tappan & Bradford's lith.

A. S. S. sc.

*Tossidens Ravenelii*. Sulliv.







W. S. S. del.

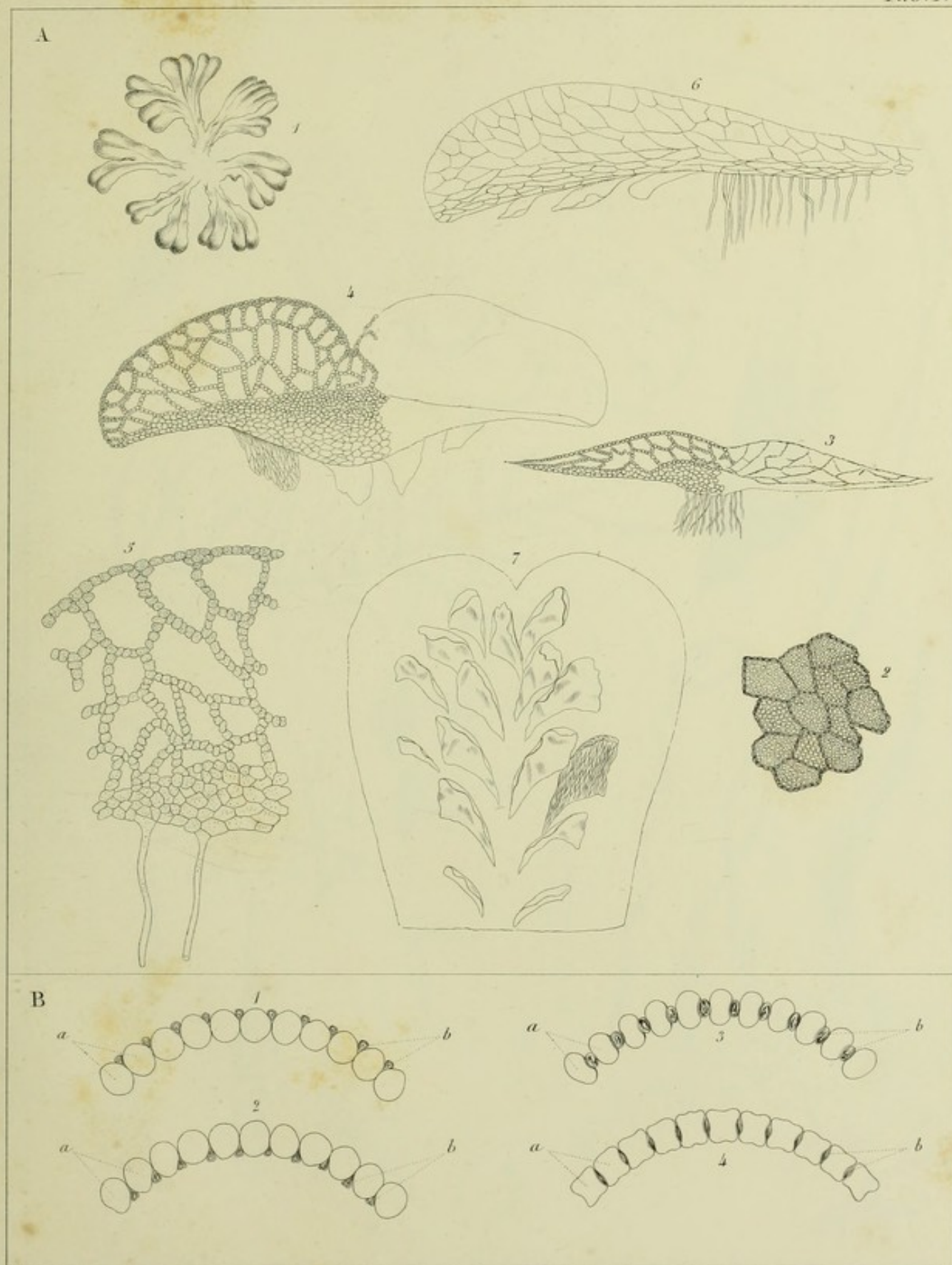
Thompson & Bradford sculp.

A. S. S. sculp.

*Dicranum rhabdocarpum* Sulliv.







W. J. S. del.

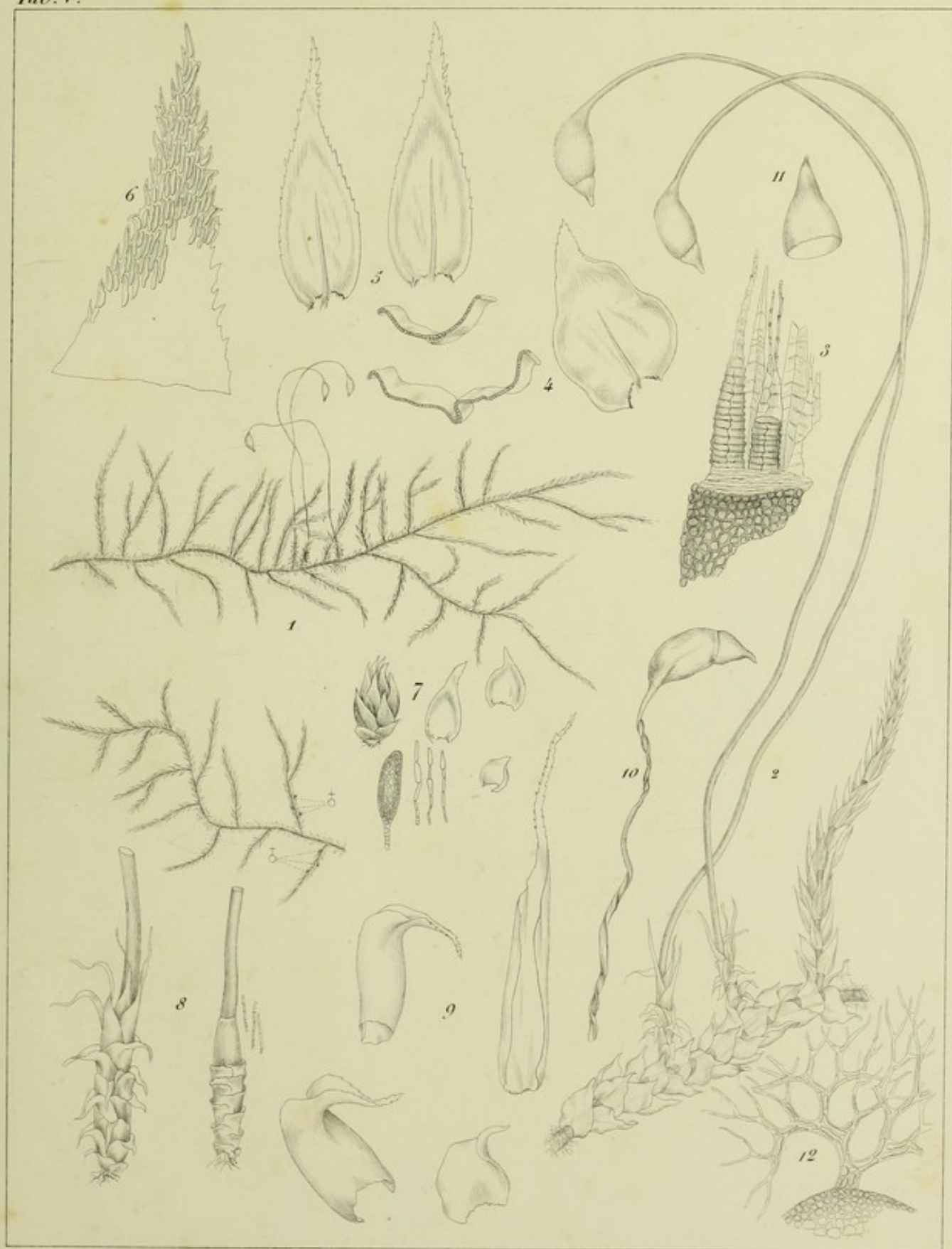
Tapman & Bradford's lith.

A. Sorel, on stone.

A. *Riccia lutescens*. Schweinitz. B. Cross sections of leaf of *Sphagnum*.







W. S. S. del.

Tappan & Bradford's Lith.

A. S. S. on stone

*Hypnum Cakesii* Sullw.















